

Process Simulate

Manufacturing process verification in powerful 3D environment

Benefits

- Reduce cost of change with early detection and communication of product design issues
- Reduce number of physical prototypes with upfront virtual validation
- Optimize cycle times through simulation
- Ensure ergonomically safe processes
- Reduce cost by re-using standard tools and facilities
- Minimize production risk by simulating several manufacturing scenarios
- Early validation of the mechanical and electrical integrated production processes (PLC and robotics)
- Early validation of production commissioning in a virtual environment
- Increase process quality by emulating realistic processes throughout the process lifecycle

Features

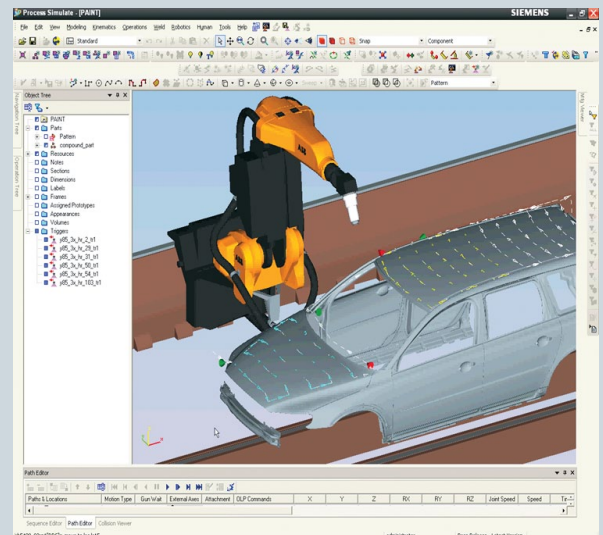
- 3D simulation
- Static and dynamic collision detection
- 2D and 3D sections
- 3D measurements
- Sequencing of operations
- Assembly and robotic path planning

Summary

Process Simulate is a digital manufacturing solution for manufacturing process verification in a 3D environment. Process Simulate is a major enabler of speed-to-market by allowing manufacturing organizations to virtually validate manufacturing concepts upfront – throughout the lifecycle of new product introductions. The ability to leverage 3D data of products and resources facilitates virtual validation, optimization and commissioning of complex manufacturing processes, resulting in faster launch and higher production quality.

The business value of Process Simulate

The increased complexity of products and manufacturing processes presents world-class manufacturers with “time-to-market” and asset optimization challenges. Manufacturing engineering teams are expected to enable flawless new product launches and adhere to cost, quality and start-of-production targets. To meet these challenges, leading manufacturers leverage their organizational knowledge and the availability of 3D models of products and resources to virtually validate their manufacturing processes upfront. With new evolving technology, thousands of validation experiments can be conducted efficiently and almost automatically to ensure upfront production optimization.



Process Simulate facilitates the design and validation of manufacturing processes in a 3D dynamic environment. Process Simulate is fully integrated

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Process Simulate

Features *continued*

- Resource modeling (3D and kinematics)
- Line and workstations design
- Documentation tools
- Natively supported JT™ visualization standard
- Human tasks simulation
 - Reach envelopes
 - Vision window
 - Postures
 - Auto grasp wizard
 - Ergonomics analysis
- Discrete and continuous process simulation
 - Projection of welds on parts
 - Gun search wizard
 - Project arc seam
 - Torch alignment
 - Weld gun validation
 - Design/modify weld gun and tooling geometry and kinematics
 - Robot reach test
 - Robot smart placement
 - Robotic simulation editing
- Robotics process simulation
 - Event-driven simulation
 - Detailed robot programming
 - Controller-specific command recognition
 - Boolean and non-Boolean signals exchange
 - Robot logic editing and validation
- Virtual commissioning
 - Model control resources (sensors and controlled devices)
 - Signal definition based on real HW
 - Simulate internal resource logic (Boolean and analog)
 - Connect virtual model with real PLC code
 - Integrated simulation using actual PLC code and HW over OPC interface

with the manufacturing backbone, thus enabling manufacturing engineers to re-use, author and validate manufacturing processes. Process Simulate provides an advanced 3D environment capable of emulating realistic behavior of manufacturing processes and optimization of cycle times and process sequence. Process Simulate facilitates simulation of assembly processes, human operations and mechanical procedures of tools, devices and robots. Process Simulate is highly scalable, providing various engineering disciplines with the data and toolset to examine detailed processes and verify them in different phases and perspectives.

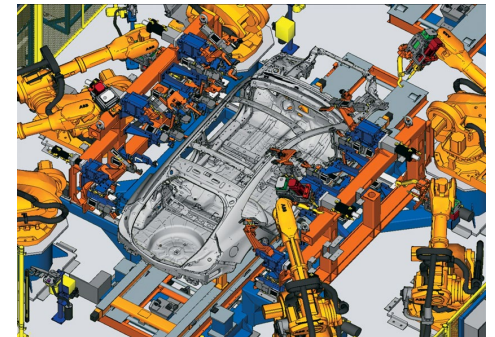
Integrated environment for manufacturing process validation

Process Simulate enables the verification of different segments of the manufacturing process. Assembly processes, human operations, welding, continuous processes such as laser welding and gluing and other robotic processes can be simulated in the same environment, allowing for simulation of virtual production zones. The simulation emulates realistic human behavior, robotic controllers and PLC logic.

Process Simulate Assembly

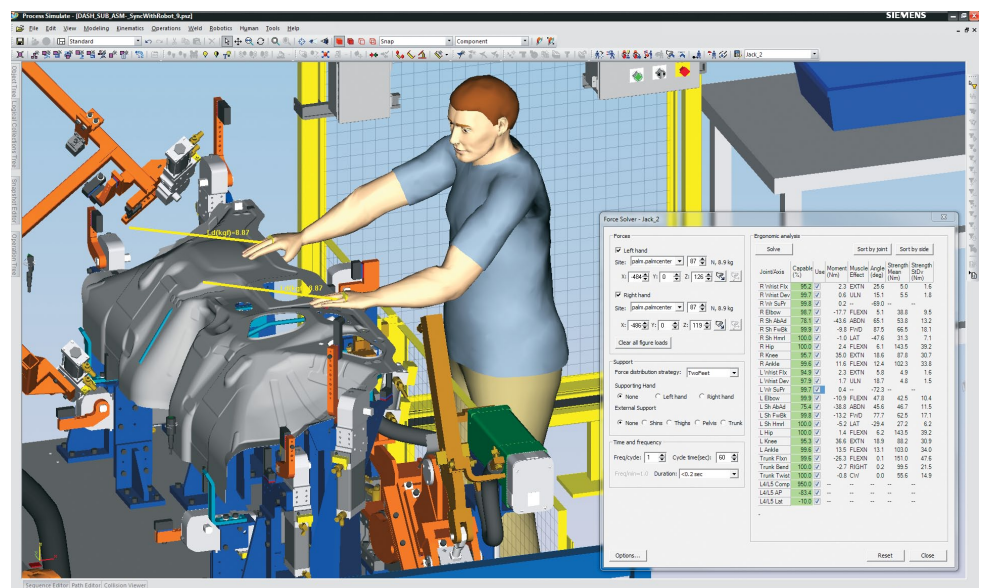
Process Simulate Assembly allows users to verify the feasibility of an assembly process. It enables manufacturing engineers to determine the most efficient assembly sequence, catering for collision clearance and identifying the shortest

cycle time. Process Simulate Assembly provides the capability to select the most suitable tool for the process by searching a classified tool library, performing virtual reach tests and collision analysis and simulating the full assembly process of the product and the tool together.



Process Simulate Human

Process Simulate Human allows users to verify the design of a workstation, ensuring the product parts can be reached, assembled and maintained. Process Simulate Human provides powerful capabilities to analyze and optimize the ergonomics of the human operation, thus ensuring an ergonomically safe process according to industry standards. Using the human simulation tools, the user can perform realistic simulation of the human tasks and optimize process cycle times according to industry standard ergonomics libraries.



Process Simulate Spot Weld

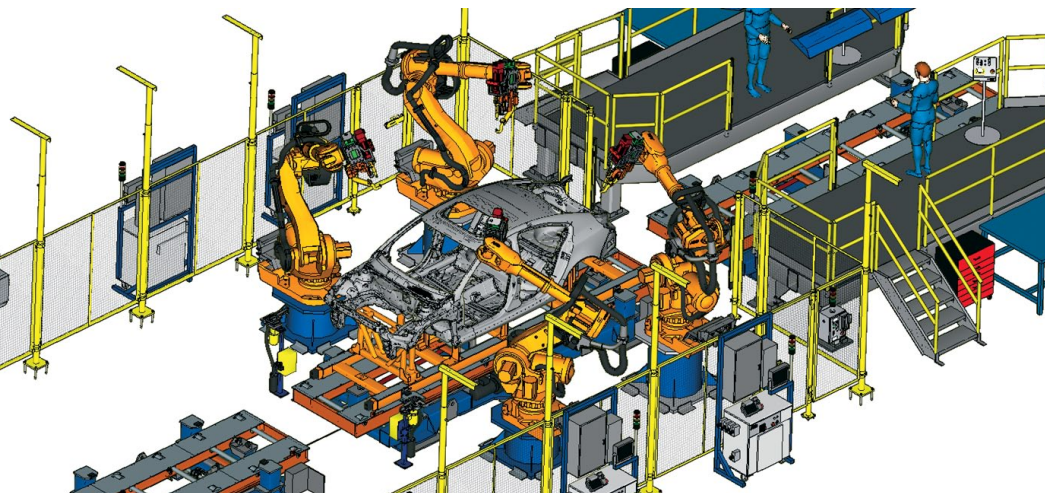
Process Simulate Spot Weld enables users to design and validate spot welding processes in a 3D graphics and simulation environment from early planning phase up to detailed engineering stages and offline programming. Process Simulate Spot Weld facilitates manufacturing engineering tasks such as distribution of weld points to stations catering for geometric and cycle time constraints and selection of best weld gun from a classified library to re-use existing guns and tools.

Process Simulate Robotics

Process Simulate Robotics enables users to design and simulate highly complex robotics manufacturing zones. Synchronizing multi-robot zones – a highly complicated task – is simplified with Process Simulate tools such as cyclic event evaluator and emulated specific robot controller. The robotics simulation tools provide the capability of designing a collision-free path for all the robots and optimize their cycle times.

Process Simulate Commissioning

Process Simulate Commissioning enables users to streamline the existing manufacturing and engineering data from conceptual design down to the shop floor. Process Simulate Commissioning supplies a common integration platform for the various disciplines participating in real commissioning of a production zone/cell (mechanical and electrical). Using Process Simulate Commissioning, users can simulate real PLC code with the actual hardware using OPC and the actual robot programs, thus enabling the most realistic virtual commissioning environment.



Contact
 Siemens Industry Software
 Americas +1 800 498 5351
 Europe +44 (0) 1276 702000
 Asia-Pacific +852 2230 3333

www.siemens.com/tecnomatix

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